CLAIMS

What I claim is:

1. A system for analyzing the performance of a tape recorder having a record input and a playback head providing an output thereof, said system comprising:

(a) a signal generator comprising a serial arrangement of a microcontroller and a digital-to-analog converter for generating *the presence of* a predetermined waveform for a predetermined duration which is routed to the record input of the tape recorder;

(b) an analog-to-digital converter receiving the output of the playback head and providing a corresponding digital signal thereof;

(c) a digital signal processor that receives the digital signal and converts it into digital data representative of elementary components thereof; and

(d) means for receiving and analyzing the digital data to determine the performance of the tape recorder.

2. The system according to claim 1 further comprising a buffer amplifier interposed between said

signal generator and said record input of said tape recorder.

3.   The system according to claim 1, wherein said signal generator comprises:

(a) a microcontroller having an accessible and retrievable look-up table defining said predetermined waveform in a digital format; and

(b) a digital-to-analog converter receiving said retrievable predetermined waveform and providing a corresponding analog signal thereof.

4.   A system for analyzing the performance of a tape recorder having a record input and a playback head providing an output thereof, said tape recorder further comprising an input signal receiver that precedes and supplies a received signal to said record input, said system comprising:

(a) a signal generator that generates a predetermined waveform for a predetermined curation which is routed to the record input of the tape recorder, said signal generator comprising:

(i) a microcontroller having an accessible and retrievable look-up table defining said predetermined waveform in a digital format; and

(ii) a digital-to-analog converter receiving said retrievable predetermined waveform and providing a corresponding analog signal thereof;

(b) a transmitter receiving said predetermined waveform of said signal generator and transmitting said predetermined waveform to said input signal receiver of said tape recorder;

(c) an analog-to-digital converter receiving the output of the playback head and providing a corresponding digital signal thereof;

(d) a digital signal processor that receives the digital signal and converts it into digital data representative of elementary components thereof; and

(e) means for receiving and analyzing the digital data to determine the performance of the tape recorder.

5. The system according to claim 4, wherein said accessible and retrievable predetermined waveform is defined so as to reduce modulation distortion encountered by being received and transmitted by said transmitter.

6. The system according to claim 1, wherein said digital signal processor utilizes a Fast Fourier Transform (FFT) to convert said digital signal.

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7. The system according to claim 1, wherein said signal generator repeatedly generates said predetermined waveform during said predetermined duration.

8. A system for analyzing the performance of a tape recorder having a record input and a playback head providing an output thereof, said system comprising;

(a) a signal generator that repeatedly generates a predetermined waveform for a predetermined duration which is routed to the record input of the tape recorder;

(b) an analog-to-digital converter receiving the output of the playback head and providing a corresponding digital signal thereof;

(c) a digital signal processor that receives the digital signal and converts it into digital data representative of elementary components thereof; and

(d) means for receiving and analyzing the digital data to determine the performance of the tape recorder, said means for analyzing digital data comprising:

(i) means for determining the fundamental frequency of said repeatedly generated said predetermined waveform;

(ii) means for determining the average of said repeatedly generated said predetermined waveform; and

(iii) means for determining the harmonic frequencies of said repeatedly generated said predetermined waveform.

9. The system according to claim 1, further comprising a plurality of display devices having means to be responsive to and serviced by said means for receiving and analyzing said digital data.

10. A method for analyzing the performance of a tape recorder having a record input and a playback head providing an output thereof, said method comprising the steps of:

(a) providing a signal generator comprising a serial arrangement of a microcontroller and a digital-to-analog converter, said microcontroller having a look-up table comprising a plurality of selectable predetermined waveforms each in a digital format;

(b) generating _the presence of_ one of said selectable predetermined waveforms for a predetermined duration and which waveform is routed to the record input of the tape recorder;

(c) receiving the output of the playback head and providing a corresponding digital signal thereof;

(d) receiving the digital signal and converting the digital signal by a Fast Fourier Transform (FFT) into digital data representative of elementary components thereof; and

(e) receiving and analyzing the digital data to determine the performance of the tape recorder.

11. The method according to claim 10, wherein said predetermined waveform is repeatedly generated during said predetermined duration.

12. A method for analyzing the performance of a tape recorder having a record input and a playback head providing an output thereof, said method comprising the steps of:

(a) repeatedly generating a predetermined waveform for a predetermined duration and which waveform is routed to the record input of the tape recorder;

(b)   receiving the output of the playback head and providing a corresponding digital signal thereof;

(c)   receiving the digital signal and converting the digital signal by a Fast Fourier Transform (FFT) into digital data representative of elementary components thereof; and

(d)   receiving and analyzing the digital data to determine the performance of the tape recorder, said step of receiving and analyzing digital data comprising:

(i)   determining the average of the digital data so as to determine the noise level of the digital data;

(ii) comparing the determined noise level of the digital data to determine if a predetermined threshold value is exceeded and, if so, generating an alarm indicative of a malfunction of said tape recorder;

(iii) determining the harmonic frequencies of said repeated digital data repeatedly generated said predetermined waveform; and

(iv) comparing the determined harmonic frequencies to determine if a threshold value is exceeded and, if so, generating an alarm indicative of a malfunction of said tape recorder.

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13. A method for analyzing the performance of a tape recorder having a record input, a playback head providing an output thereof and means responsive to a first digital quantity for adjusting a bias level of said tape recorder and a second digital quantity for adjusting an equalization level of said tape recorder, said method comprising the steps of:

(a) repeatedly generating a predetermined waveform having a predetermined amplitude for a predetermined duration;

(b) routing said predetermined waveform to the record input of the tape recorder;

(c) receiving the outputs of the playback head of said recorder and providing corresponding digital signals thereof;

(d) receiving the digital signals and converting the digital signals by a Fast Fourier Transform (FFT) into digital data representative of elementary components thereof;

(e) determining the amplitude of the converted digital data;

(f) comparing said amplitude against said predetermined amplitude and if a difference exists therebetween which exceeds a predetermined value, then

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generating said first digital quantity for adjusting said bias level of said tape recorder;

(g) determining a distortion level of the digital data; and

(h) comparing said distortion level against a predetermined distortion level and if a difference exists therebetween exceeds a predetermined value, then generating said second digital quantity for adjusting said distortion level of said tape recorder.